

CLAIMS

We claim:

- 1 1. A method of creating a value change dump (VCD) file for a modeled design on demand,
2 comprising steps:
3 selecting a simulation session range which begins at a simulation time t0 and ends at a
4 simulation time t3;
5 selecting a simulation target range which begins at a simulation time t1 and ends at a
6 simulation time t2, wherein the simulation time t1 is greater than or equal to simulation time t0
7 and simulation time t2 is less than or equal to simulation time t3;
8 generating a VCD file of the modeled design for the selected simulation target range; and
9 accessing the VCD file directly from simulation time t1 to debug the modeled design.
- 1 2. The method of claim 1, further comprising steps:
2 providing primary inputs to the modeled design for evaluation; and
3 recording a simulation history for the simulation session range.
- 1 3. The method of claim 2, further comprising steps:
2 processing the simulation history; and
3 evaluating in the modeled design the processed simulation history from simulation time t0
4 to simulation time t2.
- 1 4. The method of claim 3, wherein the step of generating the VCD file further comprises:
2 generating evaluated results from the modeled design based on the processed simulation
3 history; and
4 saving the evaluated results during the simulation target range into the VCD file.
- 1 5. The method of claim 4, wherein the step of recording further comprises steps:
2 compressing the primary inputs; and
3 recording the compressed primary inputs as the simulation history.

1 6. The method of claim 4, wherein the processing step further comprises:
2 decompressing the compressed primary inputs; and
3 providing the decompressed primary inputs as the processed simulation history to the
4 modeled design for evaluation

1 7. The method of claim 4, wherein the recording step includes the step of:
2 recording the primary inputs as the simulation history.

1 8. The method of claim 1, further comprising steps:
2 saving state information of the modeled design at simulation time t_0 in a first file; and
3 saving state information of the modeled design at simulation time t_3 in a second file.

1 9. An electronic design automation system for verifying a user design, comprising:
2 a computing system including a central processing unit and memory for modeling the user
3 (design in software;
4 an internal bus system coupled to the computing system;
5 reconfigurable hardware logic coupled to the internal bus system and for modeling at least
6 a portion of the user design in hardware;
7 control logic coupled to the internal bus system for controlling the delivery of data
8 between the reconfigurable hardware logic and the computing system; and
9 VCD on-demand logic for recording a simulation history for a selected simulation session
10 range and dumping state information from the hardware model into a VCD file for a selected
11 simulation target range, where the simulation target range is within the simulation session range.

1 10. The electronic design automation system of claim 9, wherein the VCD on-demand logic
2 further comprises:
3 first range selection logic for selecting a simulation session range which begins at a
4 simulation time t_0 and ends at a simulation time t_3 ;
5 second range selection logic for selecting a simulation target range which begins at a
6 simulation time t_1 and ends at a simulation time t_2 , wherein the simulation time t_1 is greater than
7 or equal to simulation time t_0 and simulation time t_2 is less than or equal to simulation time t_3 ;

8 dump logic for generating a VCD file of the hardware-modeled design for the selected
9 simulation target range; and
10 access logic for accessing the VCD file directly from simulation time t1 to debug the user
11 design.

1 11. The electronic design automation system of claim 10, wherein the VCD on-demand logic
2 further comprises:

3 test bench process for providing primary inputs to the hardware-modeled design for
4 evaluation; and

5 recording logic in the computing system for recording a simulation history for the
6 simulation session range.

1 12. The electronic design automation system of claim 11, wherein the VCD on-demand logic
2 further comprises:

3 process logic in the computing system for processing the simulation history; and
4 evaluation logic in the reconfigurable hardware logic for evaluating in the hardware-modeled
5 design the processed simulation history from simulation time t0 to simulation time t2.

1 13. The electronic design automation system of claim 12, wherein the dump logic dumps the
2 evaluated results from the hardware-modeled design based on the processed simulation history
3 during the simulation target range into the VCD file.

1 14. The electronic design automation system of claim 13, wherein the recording logic further
2 comprises:

3 compression logic for compressing the primary inputs; and
4 write logic for writing the compressed primary inputs as the simulation history.

1 15. The electronic design automation system of claim 14, wherein the process logic further
2 comprises:

3 decompression logic for decompressing the compressed primary inputs; and
4 data transfer logic for delivering the decompressed primary inputs as the processed

5 simulation history to the hardware-modeled design for evaluation.

1 16. The electronic design automation system of claim 13, wherein the recording logic further
2 comprises:

3 write logic for writing the primary inputs as the simulation history.

1 17. The electronic design automation system of claim 9, further comprising:

2 state save logic for saving state information of the hardware-modeled design at simulation
3 time t0 in a first file and saving state information of the hardware-modeled design at simulation
4 time t3 in a second file.

1 18. A VCD on-demand system for providing evaluated information for a selected simulation
2 target range of simulation times, the evaluation occurring in modeled design, comprising:

3 first logic for selecting a simulation session range which begins at a simulation time t0 and
4 ends at a simulation time t3;

5 second logic selecting a simulation target range which begins at a simulation time t1 and
6 ends at a simulation time t2, wherein the simulation time t1 is greater than or equal to simulation
7 time t0 and simulation time t2 is less than or equal to simulation time t3;

8 generation logic for generating a VCD file of the evaluated information for the selected
9 simulation target range; and

10 access logic for accessing the VCD file directly from simulation time t1 to debug the
11 modeled design.

1 19. The VCD on-demand system of claim 18, further comprising:

2 compression logic for receiving and compressing primary input data for the duration of the
3 simulation session range; and

4 decompression logic for decompressing the compressed primary input data and delivering the
5 decompressed primary input data into the modeled design for evaluation.

1 20. The VCD on-demand system of claim 19, wherein the generation logic further comprises:

2 dump logic for dumping evaluated information to the VCD file, the evaluated information

